Articles

A Review of Studies of the Impact of Insurance on the Demand and Utilization of Specialty Mental Health Services

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Insurers and employers perceive the demand for mental health care to be highly responsive to the terms of insurance. Better coverage, it is believed, would increase demand, increasing expenditures through use of services that may be discretionary in nature. This article attempts to shed light on this issue by summarizing and evaluating the results of more than 40 published and unpublished studies. The major criterion for inclusion was the availability of information on the size of the population covered, so that rates of utilization could be calculated. More recent studies are emphasized. If research at the population level using aggregate utilization as a dependent variable is the "first generation of research," studies of individual use over a period of a year constitutes the "second generation." The emerging research on episodes of treatment represents a new "third generation" of studies. If some progress can be made on issues of ways in which patients form expectations about their treatment and its cost, this new generation of research promises to model demand response more precisely to coverage terms that change within a year, such as deductibles or limits.

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BACKGROUND

Insurance for mental health services has been a controversial issue since third parties began paying for mental health care in the 1950s. Most insurance plans contain less coverage for mental than for physical conditions. Private insurance coverage for mental health care pays for roughly 28 percent of total expenditures, while private insurance for general medical services accounts for between 35 and 40 percent of total personal health care expenditures. More specifically, approximately 49 percent of employees have inpatient psychiatric care coverage equivalent to that provided for other conditions. Finally, 58 percent of the insured in the United States pay a 50 percent copayment rate for visits to an outpatient mental health care provider. This represents a larger degree of cost-sharing than that associated with most other services delivered in physicians' offices [1]. A major reason for this is the perception among insurers and employers that the demand for mental health care is highly responsive to the terms of insurance. Better coverage, it is believed, would increase demand, increasing expenditures through use of services that may be discretionary in nature. This article attempts to shed some light on this issue. There has been a good deal of experience and research over the past 25 years relevant to the question of the demand response to insurance coverage. The results of more than 40 studies are summarized here. Published and unpublished work is reviewed. The major criterion for inclusion was the availability of information on the size of the population covered, so that rates of utilization could be calculated. More recent studies are emphasized.

Our purpose here is to evaluate the main contributions to the literature. We emphasize that we are neither addressing the question of whether coverage for mental conditions should be the same as coverage for other conditions nor the question of the optimal insurance coverage for mental illness. Demand responsiveness is one among many considerations relevant to these questions. Our concern in this article is the empirical question of the degree of demand response to cost-sharing in mental health.

It is particularly appropriate to be concerned with the issue of demand responsiveness at this time. Coverage for mental health care is being given widespread consideration because of general pressures to reduce health benefit costs and because of increased attention being paid to the relationship between physical and mental illness. Existing surveys of the literature are out-of-date. In addition to updating earlier reviews, we intend to evaluate as well as to summarize the new studies.

Influential research on insurance and demand has relied increasingly upon econometrics to estimate the response of demand to cost-sharing. We have reviewed econometric studies here and have given special attention to the recently published report by the Rand Corporation investigating cost-sharing and the demand for ambulatory mental health care in the Health Insurance Study [2].

We recognize that the therapist and patient each play a role in the decision about the number and type of services to be provided. "Demand" by the patient for mental health care reflects the patient's preferences in consultation with the therapist. The mechanism by which coverage leads to more use may thus involve both the patient and the therapist. Although it is important for some purposes to know whether extent of coverage influences the provider or the patient, existing research does not shed much light on this issue. For convenience, we refer to the joint decision about therapy as the demand for mental health care.

We have divided our review into several sections, according to the type of study involved. The first is concerned with reports of utilization of large insured populations, which precedes evaluation of information on demand from natural experiments. This is followed by a section concerned with econometric studies. The last section summarizes our main conclusions and comments on directions for research.

DISCUSSION OF STUDIES OF LARGE INSURED POPULATIONS

A wide variety of plans exist for the provision of insurance coverage for treatment of mental disorders. Most plans place some special restrictions on the coverage for ambulatory services. Some plans limit the number of covered visits (e.g., 15 per year). Others require considerable cost-sharing (50 percent copayment) with limits on coverage such as $500 or $1,000 per year.

Insurance coverage for inpatient mental health services is more uniform. Differences exist mostly in terms of number of covered days. Coverage is usually complete after any deductible is met. The length of coverage varies from 30 days in private psychiatric hospitals in the case of some Blue Cross plans [3], to 60 days of coverage under Blue Cross of Massachusetts [4], to unlimited coverage under the CHAMPUS program [5]. A major source of variation in inpatient coverage within policies is covered service settings. Coverage for care delivered in spe-

cialty psychiatric settings is nearly always less extensive than care delivered in a general hospital.

The studies reviewed in this section represent the experience of enrollees in large group insurance plans. The utilization experience for mental health services is reported in terms of a base population, which in most cases refers to the number of individuals covered by a particular group insurance policy. The primary goal of this research is to obtain information about the demand for mental health services, a population-based concept.

METHODOLOGICAL ISSUES FOR THE INTERPRETATION OF FINDINGS

An observed level of utilization is the result of the interaction of demand and supply forces. Factors such as demographic characteristics of the population, the level of income, and the extent of insurance coverage affect demand. In a simple demand analysis, consumers are assumed to be able to purchase as many services as they like at the going price. If supply is not allowed to adjust when demand changes due to an increase in, say, the income of the population, the resulting level of utilization cannot be viewed as solely the product of a change in the demand factor. Limited availability of services may mean that consumers use fewer services than they would like. Interpretation of differences in utilization across plans or after changes in coverage within a plan must take account of supply factors.

Often, utilization data are reported in terms of total expenditure. Expenditures are equal to price times quantity and may change because of change in either factor. For example, an increase in demand may drive up price as well as increase use. In such a case, the new level of expenditure would reflect both increased use of services and price rises necessary to increase supply in the market. This is likely to occur when the population being studied is large relative to the market (see, for instance, D'Arcy [6] and Blue Cross of Massachusetts [4]).

The ability of providers to influence demand is important to the interpretation of utilization differences between insurance plans which reimburse providers in different ways. For example, since prepaid group practices do not reimburse physicians on a fee-for-service basis, one might expect utilization to be lower in prepaid groups, independent of other considerations. In the general health area, there is evidence to support provider-induced demand, but work by Sloan [7], Frank [8], and others has shown that the extent to which physicians can induce demand is limited.

Finally, adverse selection can interfere with interpretation of utilization data. Individuals with the greatest probability of using mental health services may choose to join plans that offer relatively generous coverage for those services. This would cause the observed population utilization rates to exceed the "true" rates that would be obtained if a random sample of the population were forced to buy a generous mental health insurance benefit. The experience of the Federal Employee Health Benefit Program (FEHBP) high-option plan is often cited as an example of the consequences of adverse selection.

To date, the policy regarding insurance and utilization of services has focused on the extent to which utilization is responsive to cost-sharing. While all existing evidence suggests that use of mental health services increases with decreased cost-sharing, it is also important to determine the form of a demand increase. If individuals already in treatment react to more generous insurance coverage by increasing their use of mental health services, insurance may encourage treatment of limited value. On the other hand, if more people avail themselves of mental health services in response to expanded coverage, the effect of insurance may be to bring into treatment individuals in need of care who were not previously receiving mental health services. Knowledge of the composition of differences in utilization that occurs as a result of differences in insurance coverage is critical to the policy debate. For this reason, we organize our review of empirical studies of utilization with regard to the two components of demand that may respond to insurance, cases per 1,000 and average number of services per case.

RESULTS OF UTILIZATION STUDIES

Data from 35 separate insurance plan reports are presented in Table 1. Columns 1 and 2 report the cases per 1,000 enrollees for ambulatory and inpatient services. Cases per 1,000 range from 2 for the Medicare population in 1968 to 138 in Group Health of Puget Sound during the mid-1970s. The mean rate across all plan reports was 33.36 ambulatory cases per 1,000 enrollees. Users of ambulatory mental health services had a wide range of experience with respect to the number of visits per ambulatory case. Visits per case ranged from 2.16 visits per case for Group Health of Puget Sound to 32.71 visits per case in the Washington area for high-option enrollees in the FEHBP.

The product of cases per 1,000 and visits per case is our primary summary statistic of utilization, visits per 1,000 enrollees. The range for this variable is from 51.0 visits per 1,000 to 667.46. The mean number of visits per 1,000 experienced by the plans we reviewed was

Table 1: Findings from Literature on Utilization of Mental Health Care

Study	Ambulatory Cases/1,000	Inpatient Cases/1,000	Ambulatory Visits/1,000	Visits/Case	Inpatient		Unit Cost	Cost Per Case	Cost Enrollee
					Days/1,000	Days/Case			
Dorken [5]	17.40	14.28	154.55	8.8	197.05	13.80			17.48
Spiro et al. [30][1]	4.00	3.00						172/970[2]	
Spiro et al. [30][3]	6.00	3.00	51.00	8.5				141/970	
Penjerdel [16][4]		2.90			70.2	24.2			
Richman and Brown [31]	35.00		111.00	3.25					
Wallen et al. [18][6]			60.07			10.01			
Goldensohn [32]				14.5					7.50[7]
Jameson et al. [11][8]	11.10	4.90	58.90	5.3	71.1	14.50			4.08
Fullerton et al. [12][9]			103.00		30.5				
Liptzin et al. [9]	51.31		445.03	8.6					21.00
Hankin et al. [19][10]	68.70		404.70	5.9					
Glasser and Duggan [33]	6.70	4.20	56.90	8.5	52.9	12.60			3.40
Craig and Patterson [14][11]		1.29	192.00		9.78	7.58			7.28
Cohen and Hunter [34][12]					20.80			245.73	35.72
Cohen and Hunter [34][13]					31.33			452.70	3.88
D'Arcy et al. [35]	20.00	10.00							
Giacolone [36][14]	6.65	3.28	99.05	14.90	38.28	11.64		245.57	1.61[15]
Green [37]				7.80					
Goldensohn et al. [38][16]	11.00	0.43	88.70	8.06[17]	7.77	18.00			
Blue Cross of Massachusetts [4]	28.60		306.40	10.71					11.91
Von Korff and Kramer [10]	20.40		667.46	32.71				1,299.0	

Washington Psychiatric Society [39]							
Williams et al. [40][18]	38.00	0.43	299.00	2.16	0.8	20.2	8.74
Williams et al. [40][19]	61.50	0.12	255.00	4.15	2.0	16.70	6.53
Social Security [41]	2.00	3.30			50.8	15.39	
D'Arcy [6]	85.2						
Avnet [42]	5.80	0.35	54.55	9.40	8.0	22.8	
Weiss et al. [43][20]	57.0		125.60	2.20[21]			
Hustead and Sharfstein [13][22]	7.27	1.40	256.0				12.30
Rice et al. [44][23]		156.6			1,237.0	7.9	
Diehr et al. [15][24]	54.0		577.50	10.6			23.19
Diehr et al. [15][25]	89.0		293.30	3.3			8.78
Diehr et al. [15][26]	80.0		197.80	2.5			7.57
Towery et al. [45]	20.4		667.40	32.7			26.50
Blue Cross of Michigan [46]		7.93			143.05	18.05	22.86

[1] 1970 data reported for fee-for-service plan.
[2] Outpatient/inpatient.
[3] 1970 data reported for prepaid plan.
[4] 1980 day for manufacturing enrollees reported.
[5] This is the authors' approximation.
[6] 1979 data after copayment change is reported.
[7] Ambulatory care only.
[8] 1973 data reported.
[9] Third year of experiment reported.
[10] 1976 data reported.
[11] 1976 data reported.
[12] Local 770.
[13] Local 889.
[14] 1968 data reported for inpatient, 1969 for outpatient.
[15] Estimates made by authors.
[16] 1966 data reported.
[17] This figure is the authors' estimate because reported data were inconsistent.
[18] PPG reported.
[19] IPP reported.
[20] Non-poverty cases reported.
[21] Authors' estimate due to reporting inconsistency.
[22] Aetna experience and Blue Cross-Blue Shield cost.
[23] 1967 data reported.
[24] Blue Cross data.
[25] Group Health data.
[26] United Health Care data.

240.21. This tends to comprise on average approximately 10 percent of ambulatory visits for all conditions.

The plans reviewed span a variety of populations, insurance coverages, and time periods, all of which may lead to differences in service use. For example, the enrollees in the Michigan Auto Workers study reported by Liptzin and his colleagues [9] consisted largely of auto workers who had first-dollar coverage for outpatient mental health services for the first five visits. After the fifth visit, they had increasing copayments for each succeeding block of five visits up to a 45 percent copayment rate and a maximum expenditure level of $400. This plan reported 51.31 cases per 1,000 and 445.03 visits per 1,000. In contrast is the experience of the Washington, DC area federal employees enrolled in the Blue Cross/Blue Shield high-option plan. Their plan required a $100 deductible and a 20 percent copayment rate with unlimited numbers of ambulatory visits. The population is predominantly white collar with above-average educational attainment. The report prepared by Von Korff and Kramer [10] found utilization of 20.40 cases per 1,000 and 667 visits per 1,000.

A second reason for the great variation in ambulatory utilization may relate to the presence or absence of adverse selection. In some of the reports from the literature, members of a population had little choice of insurance coverage. In these cases, adverse selection is unlikely to have affected the utilization results (see, for instance, Blue Cross of Massachusetts [4], Jameson et al. [11], Fullerton et al. [12], and Liptzin et al. [9]). In other utilization reports, there were clear choices between differing coverages for treatment of mental disorders. In these cases, adverse selection is likely (for example, Von Korff and Kramer [10], Hustead and Sharfstein [13], Craig and Patterson [14], and Diehr et al. [15]). The data do not lend themselves to the task of isolating the effect of adverse selection because of our inability to control for a variety of plan and enrollee characteristics.

The variation in inpatient utilization, while substantial, is far less than for ambulatory services. The days per case or average length of stay ranged from 10.01 days among retired mine workers to 24.2 days in the Blue Cross plans for Pennsylvania, New Jersey, and Delaware [16]. The mean length of stay was 15.22 days, which is very close to the national average for treatment of mental disorders in nonpsychiatric hospitals (13.6 days in nonpublic general hospitals, NIMH [17]). The overall utilization of the populations studied in the literature is summarized by the days per 1,000 enrollees statistic. This ranged from 1 to 197 per 1,000. These data include populations with unusually high rates of hospitalization, such as CHAMPUS and Blue Cross of Michi-

gan. The mean days per 1,000 enrollees was 41.44. This, we believe, is a reasonable reflection of the experience summarized in column 5 of Table 1. Inpatient days for mental health care, on average, account for 8 percent of all inpatient days.

Conclusions to be drawn about demand responsiveness from this level of analysis are quite limited. One approach would be to compare use of similar populations with different coverages. The most comparable populations in our survey are state civil servants enrolled in Blue Cross of Washington State and federal enrollees in the FEHBP. The populations are probably similar with regard to educational attainment and occupation mix. The two populations also have similar types of options for insurance coverage open to them. With a 20 percent coinsurance rate, Hustead and Sharfstein [13] report 256 visits per thousand for federal enrollees. Diehr et al. [15] report 577 visits per thousand for the Washington State population with a 10 percent copayment. This comparison suggests a very high demand response; but questions about comparability of the populations and the supply factors make it difficult to use such techniques for drawing conclusions.

The main usefulness of utilization studies is to define the broad parameters of utilization and to generate hypotheses to be tested under more favorable circumstances. In addition, these studies may be useful to insurers which are considering providing coverage for mental health services to a particular population.

ANALYSIS OF NATURAL EXPERIMENTS

A more promising form of analysis of the impact of insurance provision on the utilization of services is the natural experiment. Occasionally, use for a given population has been reported before and after a change in coverage. For this comparison to be a fair test of the impact of a change in copayments, the populations observed before and after the change in coverage should be the same. And, ideally, no other changes should occur in the availability of services.

Two natural experiments have been reported in the mental health services literature. Wallen et al. [18] report the results of a change in coverage for retired mine workers between 1977 and 1979. The enrollees lived largely in Western Pennsylvania, West Virginia, and Ohio. Prior to 1978, ambulatory mental health services were provided with first-dollar coverage (no copay; no deductible; no limit). The change in coverage consisted of a $5 per visit copayment with an upper bound on enrollee out-of-pocket liability of $100. The enrollee population remained stable over the study period, and no changes in provider

availability were reported. For these reasons, we interpret the change in utilization as a change in the demand for services resulting from the copayment change.[1]

After introduction of the copayment, visits decreased from 110.15 per 1,000 enrollees to 60.07 per 1,000. A small absolute change in copayments, then, is associated with a large decrease in use. Wallen et al. used this information to calculate an arc elasticity of demand. Their estimate is -0.32, which, they conclude, is relatively inelastic. The linear demand curve assumption implicit in the arc elasticity calculation implies that the elasticity must always be less than one when one point is zero price. The observed change constituted a 45 percent reduction in utilization in response to the $5 change in copayment. This is a dramatic change in demand, which should not be obscured by a misleading elasticity calculation.

The second analysis of a natural experiment was conducted by Hankin et al. [19]. This study, like the Wallen study, observed a change in copayment for a large insured population (the Columbia Health Plan in Maryland). The copayment for a mental health visit changed from $2 per visit to $10. Utilization changed from 414.4 visits per 1,000 enrollees, prior to the copayment increase, to 404.7 visits per 1,000 after the increase.

The site of this experiment complicates interpretation of the results. In the first place, Columbia is a prepaid group practice that uses a variety of rationing devices unrelated to price to regulate utilization. Among these are appointment delays and staffing limitations. In the presence of these nonprice barriers, utilization may not constitute an equilibrium in demand. A difference in utilization before and after a copayment change is not, therefore, a simple change in amount demanded. In the case of the Columbia Plan, treatment staff increased between 1977 and 1979. This is likely to have made care more accessible and to have reduced waiting periods and appointment delays. Thus, while the increase in copayment probably served to discourage utilization, the increase in staff for treatment of mental disorders probably increased use. These two phenomena had offsetting effects. Their separate effects could not be disentangled.

ECONOMETRIC STUDIES OF DEMAND

Econometric studies of the demand for mental health services attempt to overcome many of the difficulties in isolating the effects of specific variables that occur in the analysis of utilization reports from large

insured populations by controlling statistically for a variety of variables affecting utilization. Methodological issues discussed above, such as adverse selection, supply constraints on demand, measurement of utilization, and others, are also relevant in the context of econometric research. In addition, the major new issue is the measurement of insurance coverage. To estimate the effect of insurance, a variable representing coverage must be included in an estimated equation. The complexity of insurance coverage, varying in a number of dimensions, makes it problematic to interpret estimated coefficients of insurance variables. This is the single most important problem in all of the major econometric studies of demand for mental health care.

A relatively small number of studies have been reported so far. Each is discussed separately here. All major studies reported to date are concerned with demand for ambulatory services, and this supplement to *HSR: Health Services Research* contains three new, significant studies not incorporated in this review.

McGUIRE, 1981 [20]

This was the first econometric study of demand for mental health services. The main goal of the book was to consider the case for compulsory coverage (such as required by a state mandate).

Data for this study were from a Joint Information Service survey of office-based psychiatrists in 1973. Over 4,000 patients were included in the sample. One strength of McGuire's study is the detail of diagnostic and socioeconomic information available on each patient. Regression models explained a high percentage of the total variance in visits, and estimated coefficients were stable with respect to minor changes in specification of the model. Adverse selection was dealt with by using an instrumental variables procedure for the insurance variable. The main empirical finding in this book was that the demand for psychotherapy was more responsive to insurance than demand for general medical office visits. McGuire concluded that the elasticity of demand for psychotherapy was –1.0 or greater. McGuire investigated the relationship between income and response to insurance and found that lower-income groups were more responsive to insurance coverage. This finding indicates that insurance for psychotherapy would not be as distributionally harmful as many people have thought. McGuire also postulated the existence of "bandwagon effects" in demand. Widespread insurance for psychotherapy might contribute to breakdown of the stigma associated with using mental health services. Some evidence was presented supporting the existence of this effect.

The main limitations of this research stemmed from inadequacies of the data: (1) McGuire observed use only by individuals in treatment; (2) the dependent variable was the sum of actual and projected visits; and (3) the sample consisted of the last ten patients seen in a psychiatrist's typical week of practice, leading to an overrepresentation of heavy users.

McGuire attempted to deal with each of these problems. Using a technique developed by Heckman [21], McGuire corrected for selection bias arising from observing only the last ten individuals in treatment. This technique is quite sensitive to irregularities in the distribution of the disturbance term of a regression equation, which may account for difficulties that were encountered by McGuire in interpreting the correction factor in his demand model.

A second consequence of observing only individuals in treatment was that McGuire could make no direct estimate of the responsiveness of care-seeking behavior to insurance coverage. McGuire used information from federal employees in the high- and low-option plans to complete his elasticity estimates. These estimates suffer from the problems discussed above in the section on inferring the impact of use by analyzing the behavior of large insured populations.

Since completed episodes of treatment were not available, McGuire relied on psychiatrists' estimates of visits to be made by their patients. The reliability of the predictions of psychiatrists is not known. In a separate analysis of McGuire's data using only past visits as a dependent variable, regression results were similar to those reported by McGuire (Mabee [22]).

McCALL ET AL., 1981 [23]

This study used a randomized design to study the impact on services utilization of lowering copayment for psychotherapy and expanding the covered providers to include clinical psychologists. The study took place in Colorado between 1976 and 1978. The sample consisted of all Medicare beneficiaries who were randomly assigned to one of four groups: 50 percent copay with no coverage for psychologists (controls); 50 percent copay with psychologists covered; 20 percent copay with no coverage for psychologists; and 20 percent copay and coverage of psychologists. There were 5,762 beneficiaries who used mental health services. Ordinary least-squares techniques were used to analyze the impact of being assigned to one group, holding constant the demographic variables and other factors that were thought to affect utilization. Utilization was measured as Medicare-allowable use; use outside

of Medicare was not considered. McCall et al. [23] reached several conclusions based on their empirical results. First, they found that lower coinsurance produced no significant effects on utilization of mental health services covered by Medicare. Second, no evidence of substitution of inpatient for outpatient care was found. Finally, net changes in costs per beneficiary eligible amounted to $0.65.

One problem with this research is that the study did not control for the net differences in coverage for ambulatory mental health services between the experimental and control groups. While differences in Medicare coverage are clear, the randomization was not stratified by the extent of supplementary coverage. This is a critical oversight, because Colorado was a "freedom of choice"-law state. Insurers were required to cover the services of licensed psychologists delivering psychotherapy. In addition, Colorado had passed a law requiring insurers to offer $500 in outpatient mental health services coverage. Therefore, individuals who bought supplementary health insurance coverage would have coverage that exceeded coverage of the most generous of the experimental plans. Since 85 percent of the overall sample had some kind of supplementary coverage (including Medicaid), little difference in use among the groups could be expected.

More serious is the problem of an apparent lack of awareness by the Medicare beneficiaries of their broadened coverage under the experiment. As McCall et al. report, only 8 percent of the respondents to a survey of beneficiaries indicated that they knew about the experiment, and only 12 percent could "demonstrate even vague knowledge" of the experiment. Only 25 percent of the psychiatrists surveyed (but a large majority of psychologists) were aware of the experiment. The most likely reason why use did not change very much when benefits were expanded was because very few knew about the change. Because of these severe limitations, the McCall et al. study sheds little light on the effect of cost-sharing on demand.

WELLS ET AL., 1982 [2]

In 1971, the Rand Corporation began work on the Health Insurance Study (HIS). The HIS eventually enrolled 2,756 families (7,706 persons) from six sites across the country in a set of insurance plans for 3–5 years. By experimentally assigning families to insurance plans, Rand sought to avoid selection bias. Plans varied from 0 to 95 percent in the percentage of cost paid by the enrollee. All plans featured a maximum dollar expenditure (MDE) per family of $1,000 or less, limiting the financial liability of the family. The HIS was thus a study of "cata-

strophic" health insurance, popular in the early 1970s as a model for national health insurance.

Wells et al. focus on ambulatory mental health expenditures. The main finding of this report is that "the percentage response of ambulatory mental health care expense to cost-sharing on HIS coinsurance plans is roughly the same as that for ambulatory medical health care expense" ([2], p. 135).

There are many other findings in this report. Among the more important:

- Expenditures on ambulatory mental health services were about $24 per person in the free care plan, or 5 percent of total expenditures, excluding dental care. Mental health was 17 percent of the ambulatory total when all care was free.

- Most of the response to cost-sharing was in the probability of some use, rather than in the extent of use given some treatment.

- No differences in response to cost-sharing were found among income groups.

- Cost-sharing had no significant effect on the choice between mental health specialists and general medical providers.

In this article, we discuss the most important and controversial finding — that demand for ambulatory mental health care is only as responsive to cost-sharing as is demand for general ambulatory medical care. Our discussion draws on work by Ellis and McGuire [24].

Table 2, adapted from Manning et al. [25], compares expenditures for ambulatory health and mental health care by insurance plan for Year 2 of the HIS study. These comparisons form the basis of the conclusions in the Rand report. All families in the insurance plans had maximum dollar expenditure levels (MDEs) experimentally assigned to be either a dollar amount ($750 or $1,000) or a percentage of the previous year's family income (5, 10, or 15 percent), whichever was less.

Rand's conclusions — that cost-sharing for ambulatory mental health care has a moderate impact on total expenditures and that this response is comparable with the response of other ambulatory medical care — is based on comparisons of the free care plan with the 95 percent plan. Expenditures for mental health are cut nearly in half, from $24.28 to $12.83, in moving from free care to 95 percent coinsurance, subject to the MDE. This is roughly similar to the reduction in expenditures by one-third, from $138.15 to $92.05, for other ambulatory medical care.

Table 2: Expenditures on Ambulatory Care per Enrollee,
Rand's HIS, Year 2

| Plan | Ambulatory Medical Care* | | Ambulatory Mental Health Care | |
	Sample Mean (Standard Error)†	Percent of Free Plan	Unstandardized‡ Predicted Expense (Standard Error)	Percent of Free Plan
Free care	$138.15	100	$24.28	100
	(5.74)		(5.07)	
25 percent coinsurance	104.72	76	17.97	74
	(6.82)		(6.17)	
50 percent coinsurance	79.74	58	3.10	13
	(7.61)		(1.89)	
95 percent coinsurance	92.05	67	12.83	53
	(6.65)		(4.44)	

Source: Wells et al. [2], Table 6.3, p. 107.

*These numbers differ from those from Table 3 of Newhouse et al. [47] in the follow-
ing respects: the data are from Year 2 only for all six sites and expenses for drugs and
supplies and informal mental health (prorated) have been excluded.

†Standard errors are unadjusted for intra-family correlation so are biased downward.

‡The unstandardized prediction is used in order to be comparable with the samples
mean for ambulatory medical expenses.

If we were to compare behavior in the 50 percent plan with free
care, however, the conclusions would be quite different. For mental
health, use drops to 13 percent of the free care amount when individ-
uals pay 50 percent of the costs subject to the MDE, indicating a very
high response to cost-sharing. The drop in use for mental health is,
furthermore, much greater than the reduction for other medical ser-
vices.

The Rand results contain an anomaly. Expenditures "ought" to
fall continually as the percentage of costs borne by the individual rises.
This is true up to the 50 percent plan, but then a reversal occurs and
use in the 95 percent plan is higher than that in the 50 percent plan. Is
the free care–50 percent comparison a better test of the impact of cost-
sharing? Or is the free care–95 percent comparison to be preferred? It
is critical to address this question fairly; interpretation of the Rand
report turns on the answer.

Wells et al. base their interpretation of their findings upon the 95
percent plan, disregarding the 50 percent plan, since "the mental health
use estimate of the [50 percent] plan does not appear to be reliable
because site and plan are confounded" ([2], p. 108). The culprit,
according to the authors, is Dayton, Ohio, which has more than its

share of 50 percent plan members and whose members use mental health care at lower rates.

We find this site-plan confounding argument unconvincing for the following reasons. First, effects of site differences on mental expenditures are explicitly analyzed in the report and the results are found to be quite mixed. Statistically significant site differences are found only in the probabilities of any expenditures on informal versus formal providers ([2], pp. 123–27 and Appendix F). Second, even if we accept their argument and make the extreme assumptions that all of the 50 percent plan participants live in Dayton, and that Dayton residents spend only half of the national average on mental health (see [2], Table 6.10, p. 126), this would at most double the expenditure level for the 50 percent plan from $3.10 to $6.20 per enrollee per year. Expenditures would remain at only 26 percent of expenditures under the free plan and would still be less than half of total expenditures under the 95 percent plan. Third, this site-effect explanation for mental health does not explain why a similar reversal should hold true for other medical services.

There is another explanation for the reversal between the 50 percent and the 95 percent plans. The explanation is based on the fact that the MDE is reached more quickly by a family in the 95 percent plan, causing the coinsurance rate at the margin to drop to zero. With average annual health expenditures of around $1,400 for a family of four during this period, reaching the MDE would have been quite common for families in the 95 percent plan. With the marginal incentives the same for many families in the free care and 95 percent plans, it would not be surprising to find little difference in use.

The way the MDE can build in a reversal is shown in Figures 1 and 2. Figure 1 shows a demand curve for all medical care with the dollars of expenditure dependent on the share of costs paid by the consumer. For simplicity here, we ignore the impact of uncertainty and assume that medical care is just like any other good, with more of the good consumed as its price (here cost share) decreases. If there were no MDE, then this consumer (which can be thought of as a family or a single individual) would choose an expenditure level of *A* if he were required to pay 95 percent of total costs. For the two other plans shown, expenditures would be *B* (50 percent plan) and *C* (free care). The shaded bars in Figure 2 show that without an MDE, expenditures would fall monotonically as coinsurance rises.

Now consider the effect of a $1,000 MDE. In the 95 percent plan, after expenditures of $1,053 (the amount necessary to bring the consumer's contribution to $1,000), the marginal price falls to zero. Now

Figure 1: Cost-Sharing Plans in the Rand Health Insurance Study

X: Dollars of Expenditure
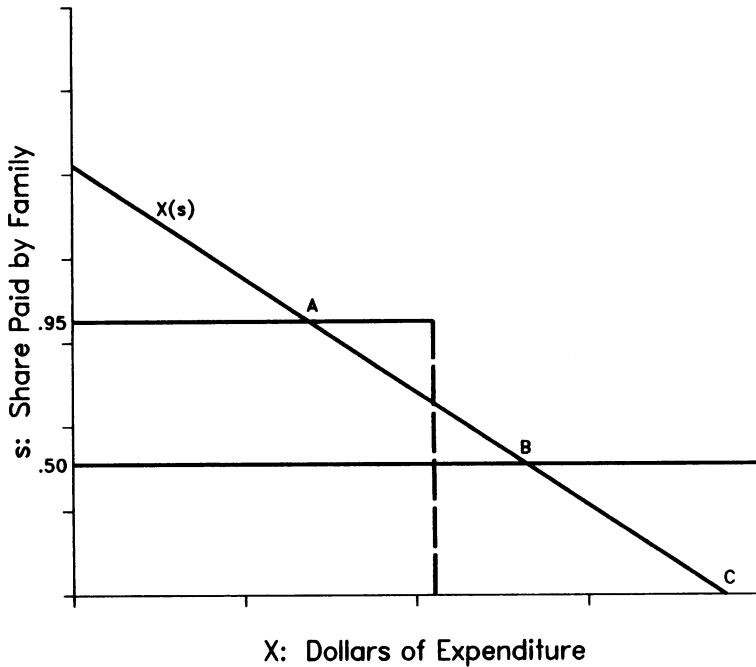
the choice of the consumer is to use C, taking advantage of the fact that after $1,053, expenditures are fully covered. The unshaded bar in Figure 2 represents expenditures in the 95 percent plan in the presence of the MDE. These now exceed expenditures in the 50 percent plan. Rand's experiment, of course, has the MDE. The "reversal" in Figure 2 and possibly in Table 2 may simply be due to the structure of incentives in the plans.

If many families in the 95 percent plan have met the MDE, which is likely since it is less than the average of family expenditures, the marginal incentives in the 95 percent plan and the free care plan would be identical. In these circumstances, the free care–95 percent comparison is a misleading estimate of the effect of cost-sharing. A consumer (family) in the 50 percent plan is much less likely to reach the MDE than a consumer in the 95 percent plan. *A priori*, the comparison of free care–50 percent would then tend to be a better estimate of the effect of percentage cost-sharing. The conclusions based on this comparison are

Figure 2:   Cost-Sharing and MDE Effects in the Rand Health
Insurance Study
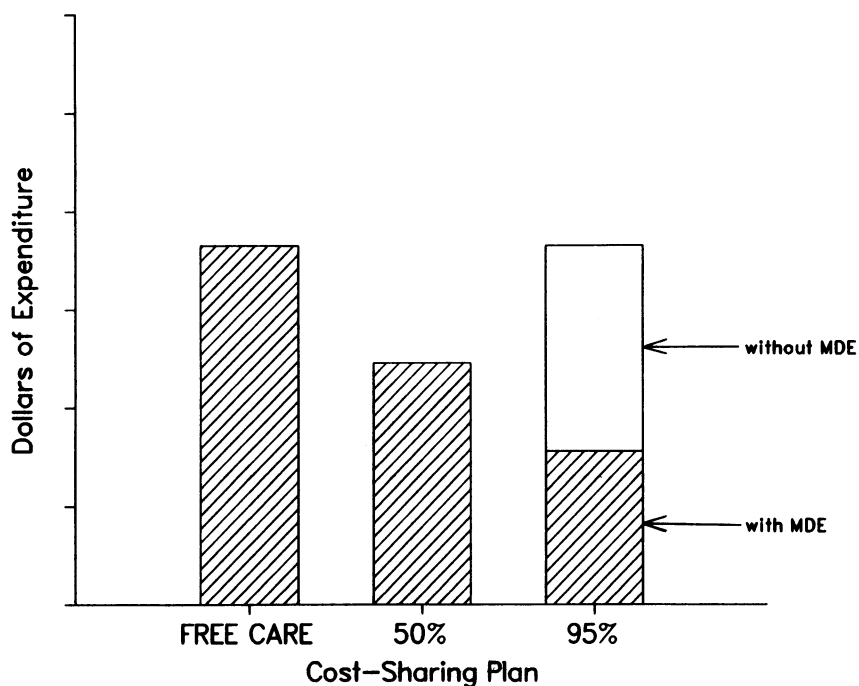
that the demand for ambulatory mental health care is highly responsive
to cost-sharing — more responsive than demand for other ambulatory
care.

The simulation analysis reported in Ellis and McGuire's paper
[24] strongly suggests that the maximum dollar expenditure (MDE)
feature of the insurance plans can cause serious difficulty for interpre-
tation of the HIS results. Incentives introduced by the MDE can
account for the otherwise anomalous "reversal" in expenditure levels
seen for both mental health and other medical ambulatory expendi-
tures in Table 2. Recognition of the effect of the MDE means that the
Rand results are consistent with the hypothesis that the demand for
ambulatory mental health care is quite responsive to cost-sharing and
is more responsive than demand for other ambulatory medical
expenses. Discarding the 95 percent plan on the grounds that it is
severely contaminated by the MDE and focusing attention, instead, on

the 25 and 50 percent plans leaves a set of results that confirms rather than contradicts previous research and third-party experience. Rand's conclusion that the demand for ambulatory mental health care is roughly as responsive to cost-sharing as is demand for other ambulatory medical services appears to be premature.

FRANK, 1985 [8]

Frank's study was concerned primarily with fee-setting and location decisions in the market for psychiatrists' services. To address these issues, location, demand, and supply equations were specified in an econometric model. The model was estimated using a time series of cross-sections where the state was the unit of observation. The years analyzed were 1970 through 1978. Three-stage least-squares, a simultaneous equations technique, was used to obtain estimates. The approach yielded separate parameter estimates for variables in the demand, supply, and location functions.

A significant feature of Frank's research is that his results were consistent with a competitive model of psychiatric services. States with more psychiatrists per capita, controlling for other variables, were found to have lower fees. The seemingly reasonable expectation that more competition reduces fees is not widely accepted in health markets. Many studies have found just the opposite, attributing the findings to target-income pricing or physician-induced demand. These hypotheses were contradicted by Frank's models of location and pricing. In addition to his finding on the effect of psychiatrists on fees, other findings of Frank's study support the existence of competition: the presence of a "freedom-of-choice" law reduces psychiatrists' fees, general practitioners reduce psychiatrists' fees, and higher psychiatrists' fees lead to a subsequent movement of psychiatrists into a state.

One of Frank's equations was a demand equation including two measures of insurance coverage, the aggregate value of health insurance benefits paid in a state and the presence of a mandate for outpatient psychiatric services. The price of psychiatrists' services was also included in the demand equation. Estimated coefficients for the insurance variables on demand were positive and of marginal statistical significance. The imprecision of the results may have been due to the use of these proxy insurance variables.

Coefficients on the price variable in the demand equation allowed Frank to make direct estimates of demand elasticity. His findings were that, depending on the sample used in the estimate, the price elasticity of demand ranged between -1.0 and -2.0. Frank's findings are consis-

tent with a high response to price reductions of the demand for ambulatory mental health care.

CONCLUSIONS

The main conclusions of this review can be summarized as follows: natural experiments and econometric studies have demonstrated that demand for ambulatory mental health care responds to cost-sharing. The degree of response is at least as great as the response for other ambulatory medical care. Our review turns up several qualifications of this result. First, constraints on supply, as in a prepaid group practice, can significantly affect consumers' use of outpatient services. Second, use of ambulatory mental health services appears to increase over time in a given population with a given coverage. This could be due to learning about benefits, breakdown of stigma, or a pattern of treatment that has no clear endpoint. Whereas new patients may appear at a constant rate in a population, cases treated per year may rise because old cases are not terminated at the same rate.

Reports from the literature do not allow assessment of the impact of insurance on inpatient use or the effect of adding eligible providers or settings as a covered benefit. Most insurance plans place restrictions on inpatient coverage, such as 45 days in a calendar year. In plans with unlimited coverage, a high proportion of days are accounted for by long-stay patients. There is thus a presumption that these limits have an impact on costs. At this time, it is impossible to quantify such an impact accurately.

Expanding coverage to new settings, such as partial hospitalization, or to new providers, such as psychologists or social workers, is often presented as a cost-saving device. These benefits might just as well be an add-on and increase costs. Insurers have some experience with these coverages, but there is no information generally available to estimate the impact of these changes on mental health care costs.

In many ways, the research done to date is of limited usefulness to those concerned with structuring reimbursement for mental health care. We know that cost-sharing has a major impact on use and costs, but we do not know how the various dimensions of cost-sharing — deductibles, coinsurance, and limits — affect use. Most insurance plans rely primarily on limits on outpatient coverage, such as $500, to contain costs. Deductibles and limits cause difficult problems for specification of the price effect, as Newhouse, Phelps, and Marquis [26] have made clear. The practical compromises made by Frank [8], McGuire

[20], and Wells et al. [2], such as use of "average price" or comparison of plans involving many dimensions of cost-sharing, have left policy-makers without guidance on the differential effects of dimensions of cost-sharing.

A second limitation of the work reviewed here is that it is not known what utilization by whom is reduced by cost-sharing. New or old users, number of cases (versus) cost per case, which diagnoses, which type of people (i.e., age diagnosis, etc.) are among the important comparisons relevant to an informed decision on structuring cost-sharing.

It is our judgment that research on use of mental health (and health) services is moving in important new directions to address these concerns. If research at the population level using aggregate utilization as a dependent variable is the "first generation of research," studies of individual use over a period of a year (such as in McGuire [20] or Wells et al. [2]) is the "second generation." The emerging research on episodes of treatment constitutes the new "third generation" of studies.

The rationale for episodes analysis is based on defining the dependent variable — use during an episode of illness — in a way that corresponds more closely to a realistic decision unit. The capacity for doing this research depends on claims-like databases that have recently become available for analysis. Probably the best example of such a database is that which has been put together in the Rand Health Insurance Study; however, other, larger claims databases may support episode analysis as well. Work at Rand and elsewhere is going forward on disaggregated medical decision making and the impact of insurance and other factors. This work has been summarized and critiqued by Ellis [27] in a recent paper.

The ability to redefine the dependent variable in studies of demand for health services raises a set of new issues for research. Prior to the emergence of visit- or procedure-level databases, the most disaggregated unit available for study was the behavior of an individual during a year. With these new data it is possible to study multiple decision points within a year. New questions raised are of the following sort:

   — What is the logical unit for decision making? When an individual initiates care with a provider, what exactly is he or she deciding upon? During an extended course of treatment, should the individual be regarded as having made the decision at the outset for all care used?

— What price should the individual be viewed as facing when he or she initiates treatment? The initial price? The price at the end of the period? An average?

Both of these sets of questions depend on the ways in which patients form expectations about their course of treatment. If some progress can be made on these issues (see Ellis [28] for more discussion), this new generation of research promises to model demand response more precisely to coverage terms that change within a year, such as deductibles or limits. Utilization need not be averaged over a year so that the impacts of cost-sharing on type of use can be given more careful investigation (see Keeler et al. [29]). This new research may significantly improve our understanding of how insurance influences treatment decisions.

NOTE

1. One difficulty in interpreting the results relates to the presence of the $100 maximum out-of-pocket liability. With the $100 maximum, the effect of the copayment change depends on the distribution of ambulatory visits across users prior to the copayment change. For example, if the average user was making 50 visits per year, we might expect a smaller effect than if the average user made 5 visits per year.

ACKNOWLEDGMENTS

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